PWM LED COLOR CONTROL

Through the use temperature sensors, accelerometers, and switches to finely control colors.

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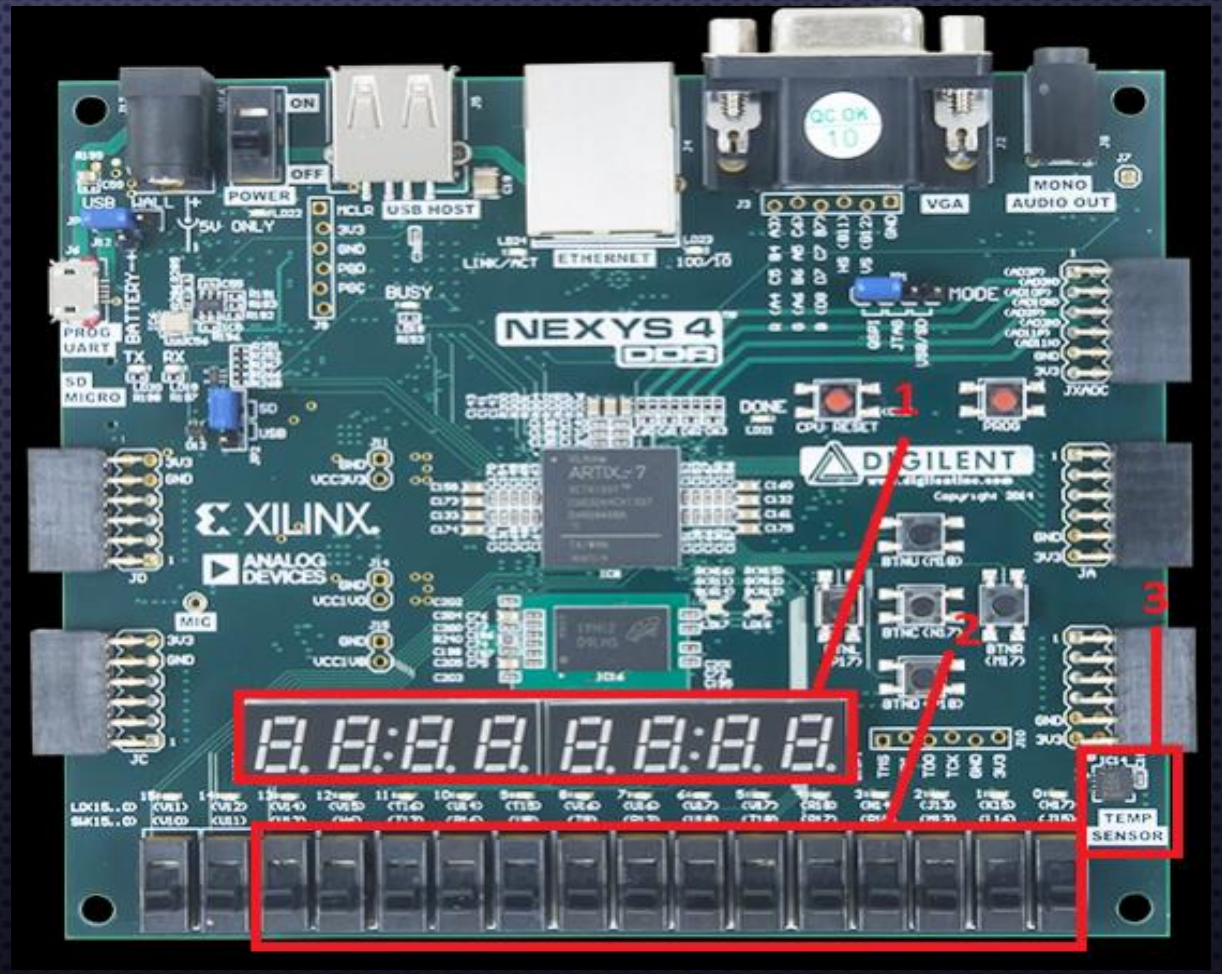
COMPONENTS

- TEMPERATURE SENSORS
- ACCELEROMETERS
- SWITCHES
- LED



INTRODUCTION

- Design idea
- Language, software and hardware
- How it works

The code:

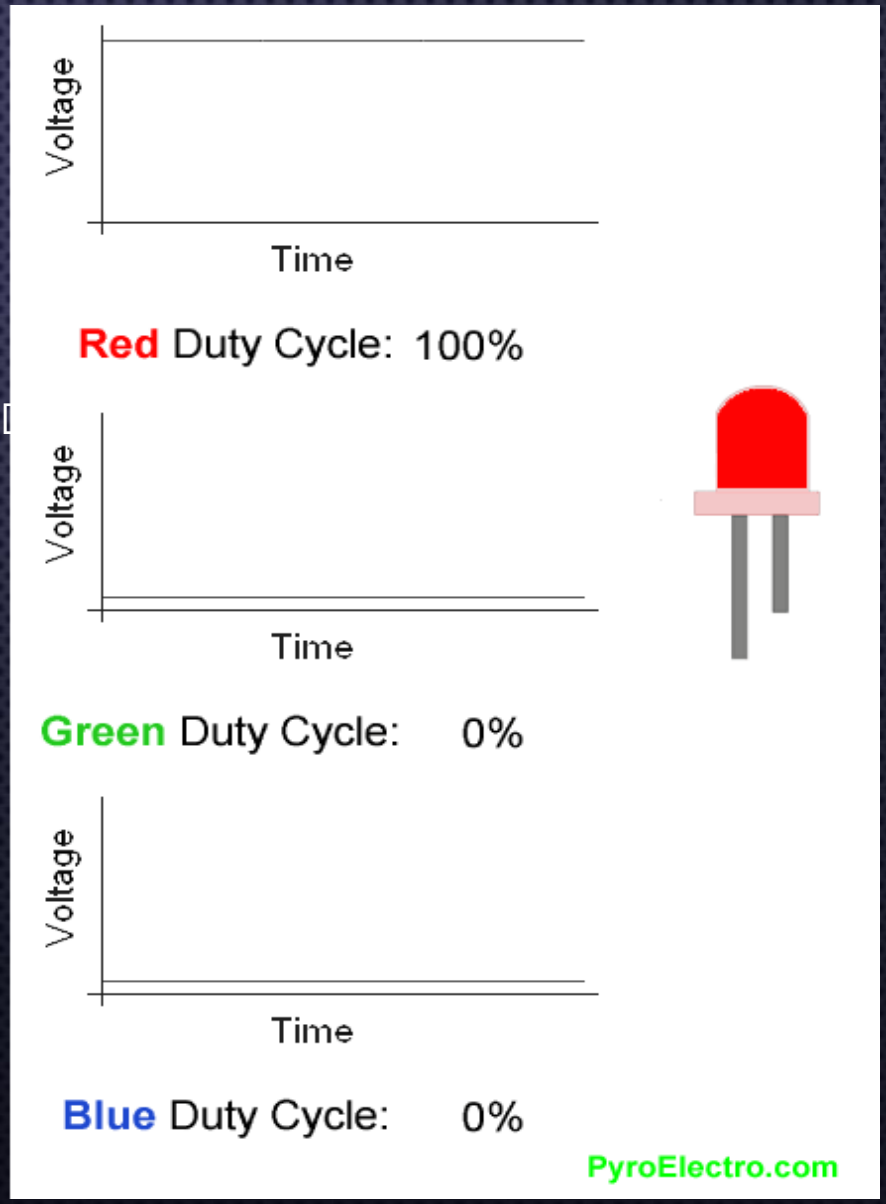
The code will be divided into 4 parts:

1. PWM
2. TEMPERATURE
3. ACCELEROMETER
4. SERIALIZER

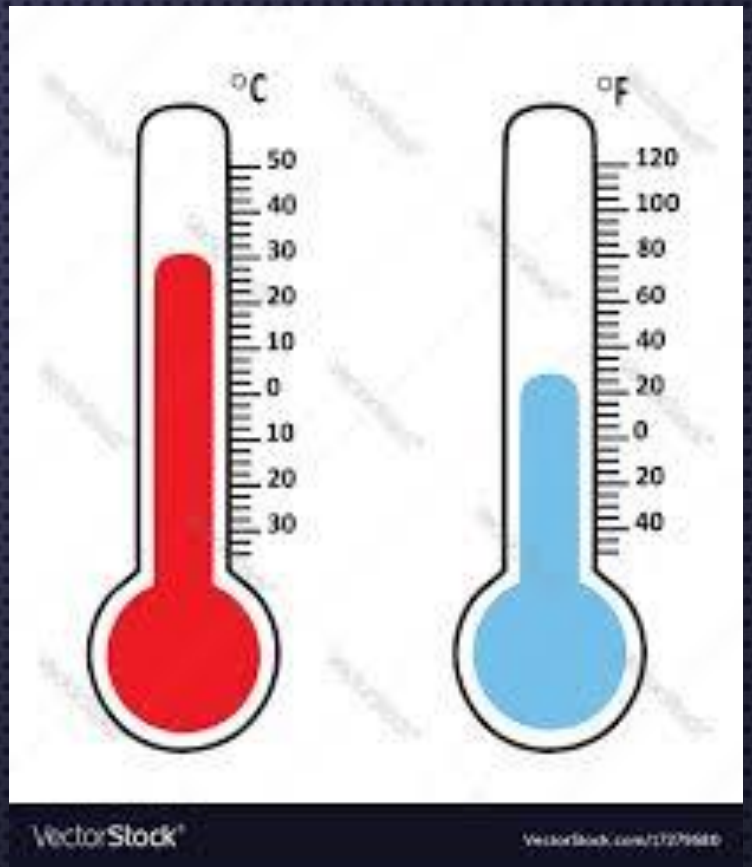
ALL THESE PARTS WILL BE COMBINED IN TOPFILE.

PWM:

- 3 PWM TO DRIVE THREE LED COLORS (BLUE, GREEN, AND RE
- IT HELPS TO CONTROL THE BRIGHTNESS OF TRI COLOR LED.



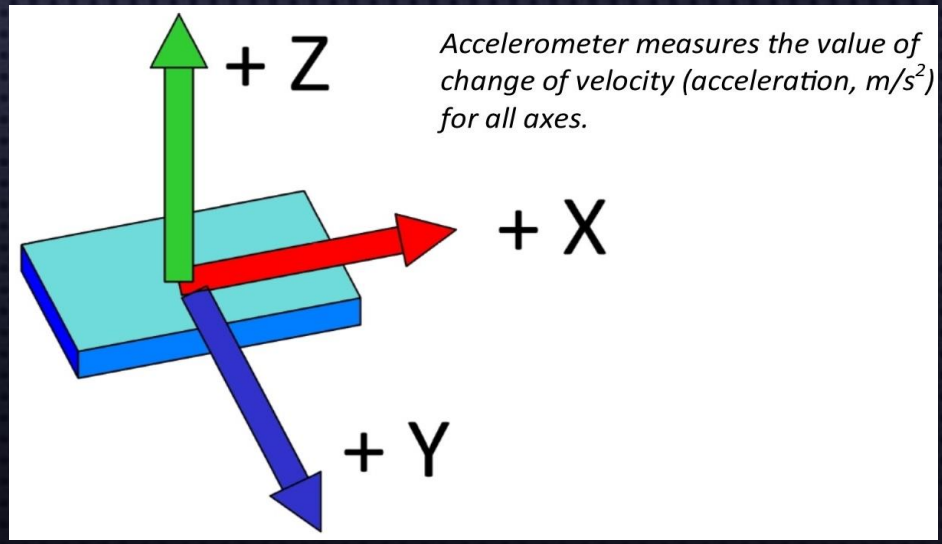
Temperature:



- FOR THE TEMPERATURE SENSOR WE USED TWO WIRE INTERFACE.
- IT IS A REUSABLED MASTER CONTROLLER IMPLEMENTATION.
- THE GOAL IS TO CONFIGURE THE ATD7420 AND READ THE TEMPERATURE CONTINUOUSLY.

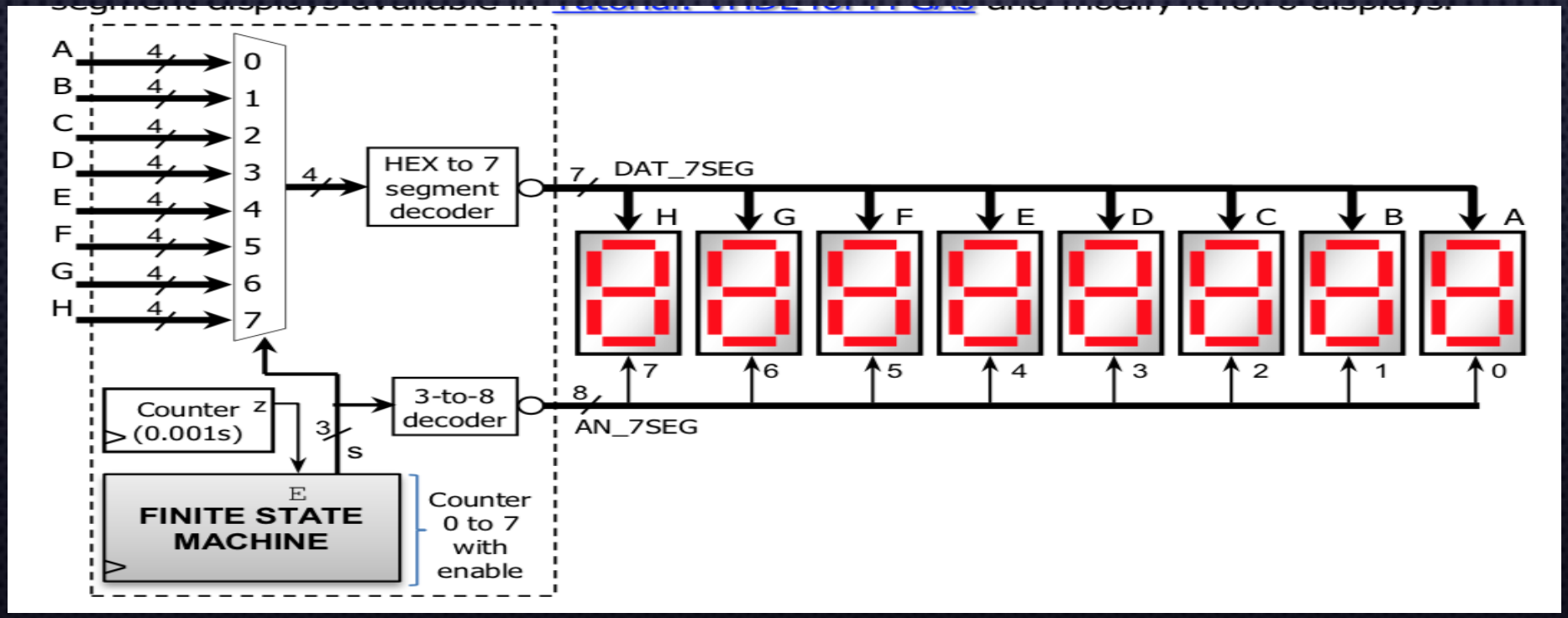
Accelerometer:

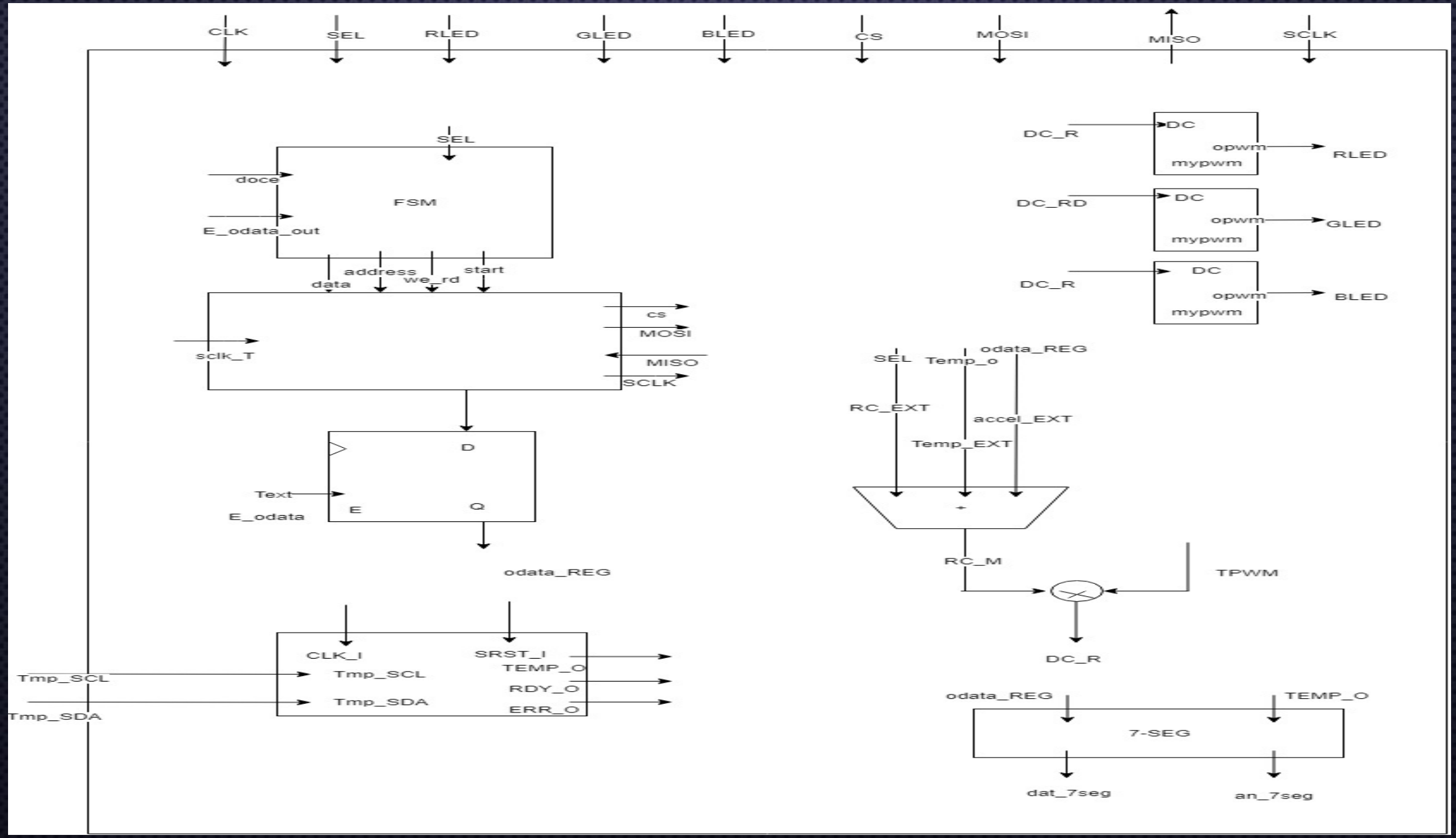
- We use wr_reg_axl362 to handle the SPI communication with the adxl362.
- Read write data via register based interface.
- Have a register to save the values.



Seven Segment Display:

- WE DID USE SERIALIZER TO SHOW THE VALUES IN 7-SEG DISPLAY.




CLK
SEL
RLED
GLED
BLED
CS
MOSI
MISO
SCLK
SEL
doce
FSM
E_odata_out
data
address
we_rd
start
cs
MOSI
MISO
SCLK
sclk_T
D
Text
E
Q
E_odata
odata_REG
CLK_I
SRST_I
TEMP_O
RDY_O
ERR_O
Tmp_SCL
Tmp_SDA
Tmp_SCL
Tmp_SDA
DC_R
DC
opwm
mypwm
RLED
DC_RD
DC
opwm
mypwm
GLED
DC_R
DC
opwm
mypwm
BLED
SEL
Temp_o
odata_REG
RC_EXT
accel_EXT
Temp_EXT
+
RC_M
TPWM
DC_R
odata_REG
TEMP_O
7-SEG
dat_7seg
an_7seg

Result

- We will demo the result at the end of presentation
- Difficulties: 7 Segment Display
  - How it was fixed
    - Connecting the display to the output temp
    - Having the display continuously update
    - Using it overall

CONCLUSIONS

Overall, we were able to color control RGB LEDs using PWM pins

- User is able to control the color of LEDs giving user accessibility through switches.
- User is able to tell which orientation the board is in by looking at the LED color.
- Temperature warning sensor that tells the user when the board is above certain temperature.

- What can be improved in the future

  A better temperature sensor will allow more accuracy in the results

  Adjusting the color and brightness of LED with temp and acceleration combined.

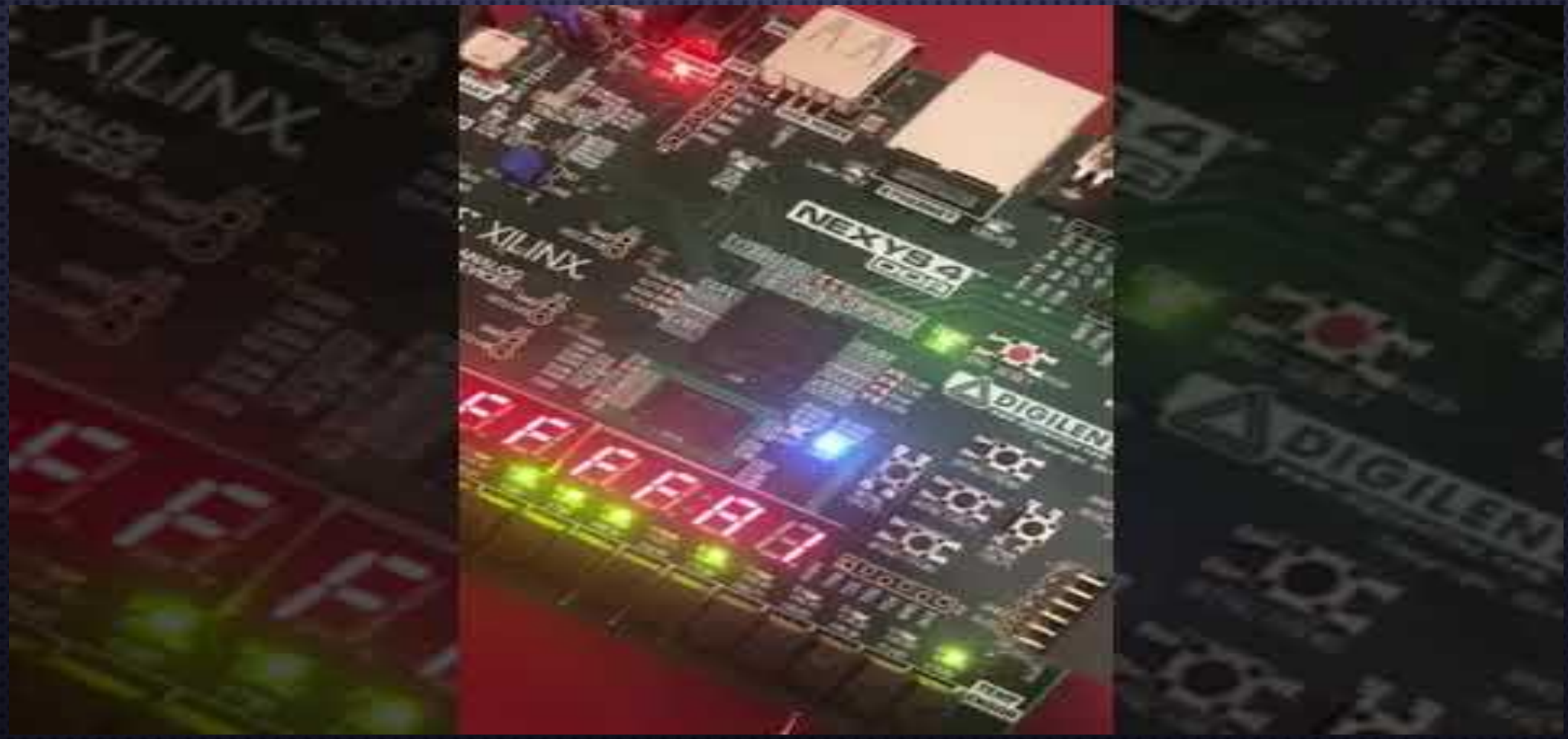
  More variety of colors overall.

*For this project, concepts from lab 3 were used.

Demonstration!

THANK YOU!

The project working



Temperature sensor working